THE MATHEMATICS TEACHER

EDITED BY
W. H. METZLER

ASSOCIATED WITH
EUGENE R. SMITH JONATHAN T. RORER

VOLUME II SEPTEMBER, 1909 NUMBER 1

THE EFFORT TO MAKE ALGEBRA YIELD FRUIT.

By W. A. Cornish.

(*Continued from p. 159.*)

If this analysis is correct it has important bearings on the world-wide effort to give concreteness to algebra. Concreteness as Smith and McMurry have pointed out is to be secured by solving problems where they are found, in their home environment. Abstractness is the sure result of taking things out of their home environment and treating them by themselves.

The home surroundings of algebra are geometry, physics, and arithmetic. Algebra has meaning and use only as it keeps intact its connection with these other branches just as mathematics as a whole has meaning and value only as it keeps intact its connection with nature.

The inference seems to be that these subjects should not be isolated and studied, first arithmetic for a while, then algebra for another while, then geometry for a third while, then reviewed and gone on with one at a time, in another rotation; but that the work ought to be carried on simultaneously in all these subjects as is done on the continent and in Great Britain.

We thought that this was what our brethren of the Central Association were striving for, but after all their violent thrashing about for the last ten years their committee reports that the work in high school algebra should consist of an elementary

course given the first year, and a more advanced course given the third year after demonstrational geometry, which is to come presumably during the second year.

If the people of the Central Association, who have been leading in the fight for reform, have made up their minds to consent for another lapse of time to the American plan of isolating the branches of mathematics in the high school course, there is probably no use in trying for a rearrangement here. With us of the conservative east, the thing that has been is, right or wrong, the thing that shall be.

And perhaps it is just as well, for in demonstrative geometry, since the time of Euclid there has been a sacrifice of subject-matter to logical method. The question has not been, what are the principles of geometry and what are they good for, but why are they true and what are the logical processes by which they are established. Geometry has been primarily an exercise book in logic and only incidentally a branch of mathematics. The traditional sequence of propositions that has resulted makes geometry rather ill-suited to be a companion book for algebra and source of algebraic material. In the first and second books there are a few definitions and principles leading to interesting algebraic problems, but they are not adequate for the purpose of illustrating and concreting algebra.

Algebra needs from the start not only lines and angles, but surfaces and solids, otherwise the terms linear, quadratic, cubic, have no meaning. The geometric principles out of which algebra most naturally grows are those pertaining to areas of plane figures and volumes of solids, similar figures both plane and solid, the relations of sides of triangles and of chords, secants, and tangents of circles. The increasing study of concrete geometry in the upper grades continued in connection with algebra in the first year of the high school may furnish a really better solution of the problem of giving concreteness to algebra than the simultaneous study of algebra and demonstrative geometry.

The conclusion then is as follows:

The suggestions of the committee of the Central Association on algebra in the secondary schools are excellent, entirely feasible, and justifiable on philosophic grounds, and ought to be endorsed and adopted in toto. And farther than that the work

in algebra during the first year of the high school should be accompanied by a concrete development of those principles of plane and solid geometry that furnish the basis of practical algebra.

STATE NORMAL SCHOOL,
CORTLAND, NEW YORK.

INTUITION AND LOGIC IN GEOMETRY.*

BY W. BETZ.

TABLE OF CONTENTS.

* An abstract of this paper was read at the Syracuse meeting.